

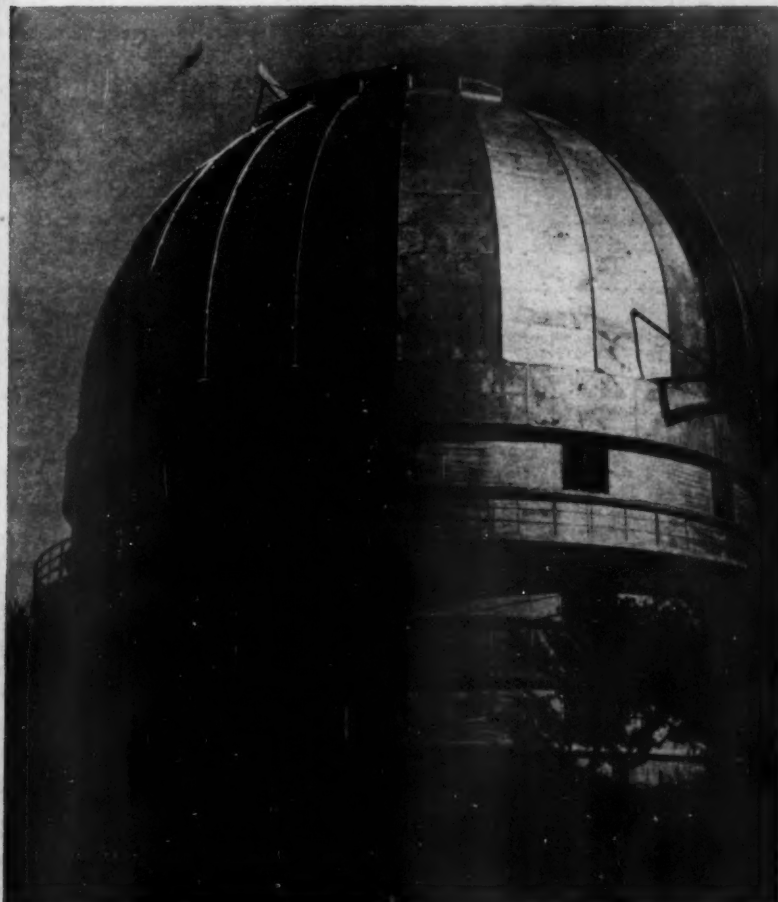
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# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



MARCH 2, 1935

Ready For The Mirror  
See Page 137

SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

VOL. XXVII



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## DO YOU KNOW?

Nearly all the world's glaciers are in retreat.

Approximately half the people of the United States use water from wells.

A mother's chance of having quadruplets is figured to be one in 654,455.

London's firemen are trying a recently approved composition helmet in place of the old brass pattern.

A typical farm harbors 10 to 100 rats, says a zoologist, adding that 50 rats would cost about \$40 a year in grain and mash they eat.

Plants and cut flowers give off water into the air, and thus help to keep the air of a room from becoming too arid from artificial heat.

Recent tests show that Canadian radium from La Bine Point, Great Bear Lake, is practically free from mesothorium, an objectionable impurity.

The measles epidemic of this winter broke a 21 year record.

Pumice stone was used by women of Rome to whiten their teeth.

Small sparks due to static electricity are known to cause occasional fires.

Our words moon and month both come from the Sanskrit root *mas*, meaning to measure.

A process has been developed for dyeing sponges, so that they may match the various bright hues of modern bathrooms.

The firefly once exercised his brains so hard that he began to glow, according to a legend told by Mayan Indians of Yucatan.

German scientists report that they can put on the German market widely different sorts of nicotine-free cigar, pipe, and cigarette tobacco.

## WITH THE SCIENCES THIS WEEK

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Why Gertrude Stein? p. 134.

## SOCIOLOGY

How much education does the murderer usually have? p. 140.

MEDICINE

# Gland Therapy Treats Heart Disease Successfully

Removal of Normal Thyroid Gave Better Results In 64 Cases Than Did Any Other Treatment

REMARKABLE success in the treatment of heart disease by removal of the normal thyroid gland was described at the University of Minnesota by Dr. Elliott Carr Cutler, surgeon-in-chief of Peter Bent Brigham Hospital, Boston, and professor of surgery at the Harvard Medical School.

Dr. Cutler discussed this radical and sensational form of surgery wherein a part of the body distant to the diseased part but having an effect upon it is attacked by the surgeon, as an example of the surgery of the future.

He spoke of this change in the treatment of the body as a unit as "A progression from anatomical to physiological surgery."

"It is a step," he said, "representing the greatly increased knowledge of the function of the body and offering the hope that surgery will become less and less a method by which parts of the body have to be removed in order to effect relief."

Reporting observations made on 64 cases in which the thyroid was removed, Dr. Cutler said that "in spite of the almost hopeless condition of many of the cases either because of decompensation or angina pectoris, results were far more favorable than those following any other methods of therapy."

Total thyroidectomy for heart disease was proposed in 1932 and the first operation of this type was reported in 1933.

## Close Relationship

Dr. Cutler pointed out that both experimental studies and bedside clinical observations had shown a close relationship between the thyroid gland and the heart, and it is known that patients who suffer repeated attacks of over-secretion of this gland (thyrotoxicosis) eventually show signs of heart failure.

Further observations showed that the speed of the blood flow roughly paralleled the basal metabolism in the body, rising when the basal metabolic rate was elevated and vice versa. Influence over the basal metabolic rate is only one function of the thyroid gland but, since it

can be measured by a simple test, is commonly used as an indication of thyroid gland function.

In patients with decompensated hearts the speed of blood flow is slow. This inter-relationship, said Dr. Cutler, suggested that when the circulatory rate in such patients could not be raised by rest, drugs or other means of medical therapy, the basal metabolic rate should be slowed by removing the thyroid gland.

In the 64 cases recounted, the only ones reported thus far, Dr. Cutler found that thyroidectomy did drop the basal metabolic rate, which in turn demanded a slow rate of circulation. When this demand dropped to the point where it could be supplied by the crippled heart, equilibrium was established and compensation resulted.

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MEDICINE

## New Disease Like Flu Puzzling Physicians

CITY and private health authorities of San Diego, Calif., are puzzling over a new illness which carries all the outward symptoms of influenza, but which does not cause any change in the patient's temperature.

While several cases of the disease have been reported, the authorities do not regard it as having reached epidemic proportions.

Those afflicted suffer all the ordinary phases of influenza—head and body aches, congested throat and nose, and general sluggishness—but run no fever whatever.

Some private practitioners are attempting in their laboratories to determine whether or not it is due to a hitherto unknown bacterium, while public health authorities are basing their investigations on the assumption it is an allergic infection, similar to hay fever.

"Any bacteriological attack is bound either to raise or lower the body temperature," Dr. Alex Lesem, city-county

health director, commented. "These cases, since there is no temperature change, probably come from some chemical reaction. Recent discoveries in hay fever and similar ailments show us that almost any kind of food or outside material can cause running noses, aches, and congested areas."

The disease is usually thrown off in a few days, leaving the patient none the worse for his experience, the doctors agreed.

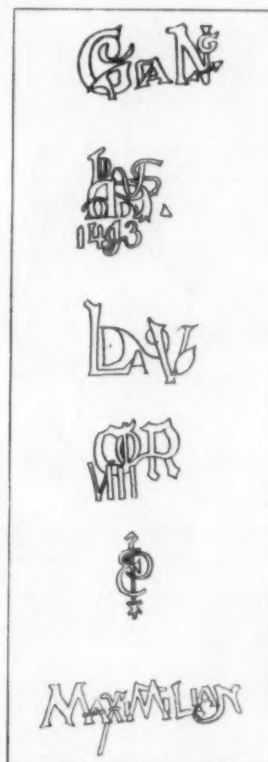
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ARCHAEOLOGY

## One of Mellon Paintings Center of Controversy

ONE of Andrew Mellon's paintings offered the nation is the center of controversy over who painted it: Botticelli or the great master of many arts, Leonardo da Vinci.

Usually credited to Botticelli, "The Adoration of the Kings" bears obscure signatures and inscriptions that mark it from the brush of Leonardo. This is the contention of Prof. J. D. Paulson of



## FAMOUS NAMES

Names and monograms found by Prof. Paulson on the painting he believes to be a lost da Vinci. The monogram of da Vinci is said to appear twice, once on the shoulder of his own portrait with date 1493, again, lower center as a signature.





#### CONTROVERSIAL PICTURE IN MELLON ART

Famous people of Leonardo da Vinci's day, and Leonardo himself, were models for this painting, and portraits are actually identified by names or monograms, claims Prof. Paulson, arguing that "The Adoration of the Kings" is a lost da Vinci masterpiece. Among ten celebrities thus said to be immortalized are Emperor Maximilian (foremost kneeling figure, left); Charles the Eighth of France (standing, crowned, beside Maximilian); Leonardo (third from front in right group, standing with folded arms).

North Carolina State College, put forth a year ago.

If his contention wins acceptance, it means that the painting may be prized even more highly than it is now.

Prof. Paulson, who studies famous paintings of uncertain authorship for signatures and inscriptions, detected a number of portraits and names, including that of Leonardo, on the picture of the kings offering their gifts.

That da Vinci's name was added later is the tentative verdict of Prof. Frank J. Mather, Jr., professor emeritus of art and archaeology of Princeton University, one of the critics consulted by Prof. Paulson.

Prof. Mather said:

"I believe inscriptions discovered by Paulson are there, but not of the period of the picture and of no significance for the problem of authorship. I think the inscriptions have been added later by some ill-informed and too-hopeful owner."

The painting, once in the Russian royal Hermitage, has been considered a Botticelli for over half a century.

Prof. Paulson has urged that ultraviolet ray photography would show whether or not the signature and other inscriptions are part of the original work or later additions.

*Science News Letter, March 2, 1935*

#### PSYCHIATRY

## New Personality Tests Described to Psychiatrists

**A** NEW test which gives a clue to a man's personality by showing just how he reacts to a baffling situation was described by Dr. Saul Rosenzweig, of Worcester, Mass., State Hospital, at the meeting of the American Orthopsychiatric Association.

The new test may also throw further light on certain mental disorders, since in these conditions patients react in one

of three ways to baffling situations.

Instead of asking questions to find how the patient takes defeat or failure, the psychiatrist using the new test gives the patient a number of problems to solve within a limited time. The problems are chosen so that the majority of them cannot be solved within the time limit.

As a result the patient finds himself

up against the type of situation which psychologists call frustration. How he meets this situation is what the examining psychiatrist wants to know. The new test, Dr. Rosenzweig believes, will give the answer more truly than the old method of asking the patient what he would do under such circumstances.

When a person experiences frustration, Dr. Rosenzweig explained, there are, in addition to the objective way, three common subjective ones in which he may react.

"For one thing, he may blame the external world (other people or things), display anger, and await an opportunity for revenge. This sort of reaction may be called 'extrapunitive.'

#### May Blame Himself

"Again, he may blame himself when frustrated and have feelings of unworthiness, humiliation or guilt. This kind of reaction may be called 'intro-punitive.'

"Finally, there is a sort of subjective reaction to frustration in which the person attacks neither the external world nor himself and is more interested in condoning than in condemning. He attempts to pass off the unhappy occurrence as an accident, something that no one could have helped and that no one was to blame for, even if doing this involves a certain amount of self-deception. This manner of reacting to frustration may be termed 'impunitive.' All three designations are derived from the Latin root meaning to punish; the prefix indicates the attitude toward and the direction of the punitiveness.

"Studies are being made to determine whether individuals follow some one of these types of reaction consistently, at least in a given kind of situation. In the first instance, these types, it will be noted, are intended to apply to particular reactions rather than to total personalities. Whether they can be extended in the latter direction remains to be seen."

#### Another Trait Measured

Ability to get along in the world is another personality trait that will soon be measured by a scientific test just as intelligence now is.

First steps in the development of such a test were reported to the same meeting by Dr. Edgar A. Doll of the Training School at Vineland, N. J.

The ability of the ordinary man or woman to manage himself and his affairs "with ordinary prudence" is pretty thoroughly tested in daily life. Lack

of this ability is recognized by the layman who calls the unfortunate person a fool, nitwit, dumbbell or some other uncomplimentary name.

Psychiatrists use the same criterion of ability to get along in determining whether a feeble-minded or mentally disordered person must be kept in an institution or may be released to live at home without daily supervision.

So far, however, the scientists have had no scientific measuring rod for the improvement in this direction made by a patient at a mental disease hospital or a child in the guidance or behavior clinic.

To fill this lack, Dr. Doll has devised what he calls a "genetic scale of social maturity." It consists of 115 items arranged in order of increasing difficulty and designed to measure social adequacy from infancy through adulthood in terms of responsibility, independence, self-help and self-direction.

Although relatively simple and easily given by experienced physicians, Dr. Doll cautioned against use of the scale by laymen. The information used in scoring, he explained, is obtained not from the subject himself but from informants who know him intimately.

*Science News Letter, March 2, 1935*

## PHYSICS

## New Coldest Cold Reached In Leyden Laboratory

**Netherlands Scientists Produce Temperature One Five-Thousandth of a Degree Above Absolute Zero**

FROM the world-famous low temperature laboratory of Leyden University in The Netherlands a new low in the "coldest cold" temperature is reported. Prof. W. J. De Haas and his colleagues have reached one five-thousandth of a degree above absolute zero in their experiments.

Absolute zero is 273.15 degrees below zero on the centigrade scale, and 459.6 degrees below zero on the Fahrenheit classification.

But how was the temperature measured? How, for example, can one measure a temperature where all liquids are solid and all gases liquid; where a mercury thermometer is frozen fast in its glass stem and even the hydrogen in a gas thermometer has liquefied to a mere drop of fluid? No thermometer in an ordinary sense can be used.

Prof. De Haas measures his temperatures with a magnetic thermometer. How it works is bound up with his method of attaining the low temperatures.

The Leyden experiments are based on the fact that in chemical salts having random orientation of all their little internal unit magnets, there will be less energy in the sample if it is strongly magnetized in the field of a giant electromagnet.

Using special salts cooled first to the temperature of liquid helium at only 1.6

degrees above absolute zero, Prof. De Haas lowered the energy of his samples by putting them in a field of 30,000 gauss. (Gauss is the unit of magnetism, just as volt is the unit of electrical potential.) The component of the earth's magnetic field which moves compasses, by comparison, is only three-tenths of one gauss.

Then quickly the applied magnetic field on the sample was lowered from 30,000 gauss to but 25 gauss. The theoretical unit magnets of the sample, called magnetons, then went back to their normal random positions.

But they needed energy to swing themselves back. The sole place for obtaining this necessary energy was from the heat of the sample. Thus as the heat energy was used up, the sample became colder and colder.

Shortly, however, the sample began to warm up again to the temperature of the helium bath. Prof. De Haas measured the rate of this warming up process by detecting the magnetization of the sample. He obtained a curve showing how magnetization varied with temperature.

The final step was to prolong the curve backward and in so doing he was able to deduct that the temperature of the lowest point was but one five thousandth of a degree above the real "bottom" of all temperatures.

*Science News Letter, March 2, 1935*

## MENTAL HYGIENE

## Warns Against Brooding Over Past Mistakes

OLDER people were warned against brooding over their mistakes and making too little of their successes, in an address on mental health, happiness and efficiency given by Dr. C. A. Bonner, superintendent of the Danvers State Hospital.

Childhood is the golden age for mental hygiene, Dr. Bonner said, for if good habits of thought and behavior can be formed early in life, much mental disease and much unhappiness can be prevented. It is in adolescence that the larger proportion of mental diseases develops. Children should be properly prepared to meet the difficulties of adolescence and thus to avoid breakdown of mental health.

Maturity, however, does not make people immune from mental illness. Later on in life, particularly when there is a decline in the mental and physical powers, adjustments must be made and vigilance must be exercised in order to maintain good mental health.

Mental hygiene has two points of advice for persons at this age.

"First," Dr. Bonner said, "fixation on the physical symptoms must be avoided lest from a few real symptoms there develop a multitude of much more incapacitating ones. Second, the mental activity of these persons must be continued as usual. By keeping young in interests and in mind and by directing attention toward the use of their mental functions they will be stimulated through their own activity to feel that life still holds much in store."

Dr. Bonner stressed the danger to mental health that unwarranted worrying brings and quoted advice from Edward Everett Hale on this point.

"We should never attempt to bear more than one kind of trouble at once. Some people bear three kinds—all they have had, all they have now, and all they expect to have."

"Within that statement is set forth the essence of mental hygiene. If we could only keep these words before us constantly our days would be more serene, our nights more restful, and our production would reach its fullest extent with happiness and efficiency."

Dr. Bonner spoke over the Columbia Broadcasting System under the auspices of Science Service.

*Science News Letter, March 2, 1935*



PSYCHIATRY

# Gertrude Stein Explained

**Puzzling Writer Once Was Student of Münsterberg At Harvard Where She Studied Automatic Writing**

By JANE STAFFORD

"POPCOCK!" said Gertrude Stein. With this unusually lucid and brief remark the writer who has grown famous for her "a rose is a rose is a rose" style dismissed recent efforts of scientists to explain her work.

"Popcock is popcock is science is popcock," Miss Stein might have been expected to say. But she did not, according to the report. For once, she failed to repeat herself or to bewilder her hearers.

The scientific explanation is that her writing is done with her wrist and not with her mind. Automatic writing is the scientific term for it. Miss Stein not only disagrees, but takes the view that her writing does not need explaining.

If you have seen her play, "Four Saints in Three Acts," or have read any of her other strange writings, you probably feel that she needs as much explaining as that other famous "stein"—Einstein—who also always draws a capacity crowd but whom hardly anyone in the audience understands.

In giving the scientific explanation for Miss Stein's literary productions, the editor of the *Journal of the American Medical Association* starts with a question that has undoubtedly occurred to you as you read her work.

Reduced to everyday speech, he asks, is she "kidding" her readers or is her stuff just "nerts?"

## Familiar to Psychiatrists

He points out that her type of writing is familiar to psychiatrists as one symptom of certain mental disorders. This makes him wonder whether "the literary abnormalities in which she indulges represent correlated distortions of the intellect or whether the entire performance is in the nature of a hoax and that Miss Stein produces her literary effusions with her tongue in her cheek."

Taking for granted that she is not writing with her tongue in her cheek, what kind of mental distortion or "nut-tiness" is she indulging in and why does she write that way?

Scientists have a number of long

words to describe the strange way people with disordered minds sometimes write and talk—the way which is similar to Miss Stein's writings. Automatic writing—apparently letting the wrist do the work instead of the mind—is one of these psychological terms. Palilalia, perseveration and verbigeration are the others.

"Palilalia," explains the editor of the medical journal, "is a form of speech disorder in which the patient repeats many times a word, a phrase or a sentence which he has just uttered. In addition, the speech tends to be uttered more and more quickly and less distinctly."

He gives as an example of this the case of a man at a movie who found himself reading aloud the captions of the films over and over again. In the days of silent picture, this seemed to be a fairly common affliction, but the people who may have annoyed you in this way were probably not all suffering from palilalia. The man in this case could not stop. His wife who was with him became annoyed, jabbed him in the ribs and told him to "shut up." The poor man could only answer.

## "Can't Shut Up"

"I can't shut up. I can't shut up. I can't shut up."

This went on until he eventually did shut up because his speech became inaudible. This patient was suffering from the mental disturbance which sometimes follows an attack of epidemic encephalitis, or "sleeping sickness" as it is popularly called.

Comparable to this palilalia is palilogia, the kind of writing in which a word or sentence is deliberately repeated in order to emphasize it. Something like this, but not the same, is verbal perseveration, in which the same word or phrase is repeated, not for the purpose of emphasis, but as though the original idea persisted in the speaker's mind for an undue length of time, keeping fresh ideas from entering. Perseveration, of course, is not normal and is a symptom of mental disorder.

Sometimes patients afflicted with dif-

ficulty in expressing themselves repeat the statements or questions put to them, instead of answering or commenting. This is called echolalia.

Finally, in the mental disease, dementia precox, the patient repeats the same sentence over and over again. The layman as well as the physician recognizes this as the sign of a disordered mind. The condition is known as verbigeration.

It is the automatic writing—writing whatever comes to your fingertips without effort—that is interesting in connection with Gertrude Stein. Automatic writing furnishes the scientist with a possible explanation for her bewildering if amusing literary creations.

## The Clue

The clue that led to this explanation seems to have been contributed by one B. F. Skinner. He unearthed the fact that Miss Stein many years ago made a study of automatic writing. She worked at Radcliffe College under the famous psychologist, Prof. Hugo Münsterberg. Mr. Skinner reported in the *Atlantic Monthly*. As a result of this work, Miss Stein and a colleague, Leon M. Solomons, wrote a paper under the title, "Normal Motor Automatism," which was published in the *Harvard Psychological Review* for September, 1896.

Miss Stein and her colleagues experimented on themselves, to see how far they, two normal people, could go in the path down which patients with disordered minds are forced by their affliction. Presumably they hoped in this way to learn more about the nature or cause or processes of disordered minds.

Put scientifically, they "attempted to investigate the limits of their own normal automatism, undertaking to see how far they could split their own personalities in a deliberate and purely artificial way."

To a certain extent they were successful, Mr. Skinner says. They got to the point where they could perform many acts, such as writing or talking aloud, in an automatic manner while carrying on some other activity at the same time.

Spontaneous automatic writing became easy after a little practice, Miss Stein reported. Did it become so easy that it became a habit, or that she came to prefer it to other more laborious ways

of writing? She herself denies that her present writing is automatic, but to the average reader, and apparently to the scientist, it seems more automatic than anything else. In her report she said of this kind of writing:

"A phrase would get into the head and keep repeating itself at every opportunity, and hang over from day to day even. The stuff written was grammatical, and the words and phrases fitted together, all right, but there was not much connected thought. The unconsciousness was broken into every six or seven words by flashes of consciousness, so that one cannot be sure but what the slight element of connected thought which occasionally appeared was due to these flashes of consciousness. But the ability to write stuff that sounds all right, without consciousness, was fairly well demonstrated by the experiments."

### Useful Knowledge

With this report of her own experiments in mind, you might like to re-read some of her writings like the sample from "Wherein the South Differs from the North" which appears in her book, "Useful Knowledge" published by Payson and Clarke, Ltd.

Count count count.

How many countries can you have counted.  
How many countries have you counted in this count.

How many countries have you counted.  
North by north.  
Counted.

Lost it up lost is as up, lost it up, happily  
lost it as up and lost it as up. You don't say so.

Lost it up. Lost is as up. And happily lost  
it as up. Lost is up.

Lost it as up.

That is done.

One run. Say so.

One run that is done say so.

Say so that is done one run that is done.

Not not hot.

Not not as what.

Not and not.

Not as hot.

Not as what.

Not.

North.

South.

Plenty of time.

North and south as we say plenty of time.

Not north for nothing.

Not for nothing.

Not north and not for nothing.

Not north and not for nothing. North not for nothing.

For nothing.

South for nothing.

Not South.

Not for the South and not for nothing.

"Obviously, therefore," comments the editor of the medical journal, "the writing of Miss Gertrude Stein, such as appears in her plays, books and poems, is quite the same as she developed when experimenting with spontaneous automatic writing."

"Mr. Skinner points out that the ordinary reader cannot infer from this writing that the author possesses any consistent point of view, because there is seldom, if any, intelligent expression of opinion."

"Her writing seems to be the result of a stream of consciousness of a woman without a past."

"Stream of consciousness" is the name for a style of writing adopted by a number of modern authors. A notable example is the "Ulysses" of James Joyce. You may have found this and the other books written in this style difficult to follow, but probably not as hard to read as Miss Stein's works.

### Second Personality

"Mr. Skinner," continues the medical editor, "is convinced that this spontaneous automatic writing by Miss Stein is that of a second personality successfully split off from her conscious self, and unfortunately a personality without any background, intellectual opinions or emotions."

"The mere fact that Miss Stein herself occasionally appears in the midst of the writings of this second personality would seem to be the proof of the opinion."

So if you have been bewildered by Miss Stein's writings and have won-

dered how she got that way and why, here is an explanation on a scientific basis—an explanation derived from her own scientific investigations.

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*Science News Letter, March 2, 1935*

### PALEONTOLOGY

## New Hampshire Was Under Sea in Devonian Epoch

**C**ONCLUSIVE fossil evidence that an arm of the sea covered central New Hampshire for a period of from fifty to a hundred million years longer than geologists have previously believed, has been found by Prof. Marland P. Billings of Harvard University and Dr. Arthur B. Cleaves of Lafayette College, Pennsylvania.

Several hundred specimens of fifteen species of fossils positively identified as belonging to the lower Devonian epoch have been found by the two scientists in the vicinity of Littleton, northwest of the White Mountains and about ninety miles inland from the Atlantic coast. It had not been previously known that the sea in this period extended into New Hampshire, although its extension into other areas at that time had been ascertained.

Fossils of the Silurian period, believed to have begun about 400 million years ago and to have continued until the Devonian epoch, have previously been found in this area and told science that the sea was there at that time, but until the present discovery, no fossils satisfactorily identified as Devonian had been found in the region. Consequently the continuance of the sea in that area for fifty million additional years was unknown.

*Science News Letter, March 2, 1935*

### NECK AND NECK

*A snail race is here recorded by the camera of Miss Cornelia Clarke.*





## MEDICINE

**Photograph Heart Sounds By New Method**

A METHOD of photographing heart sounds has been devised by three Iowa scientists: Dr. Walter Bierring, president of the American Medical Association; Dr. H. C. Bone and M. L. Lockhart, all of Des Moines. (*Journal of the American Medical Association*, Feb. 23).

The apparatus, called the electro-stethograph, is said to have advantages over other methods of recording heart sounds in current medical usage.

A viewing screen is used on which the vibrations from the heart can be seen at the same time the physician is listening to and photographing the heart sounds. This aids in obtaining good photographic records and in detecting certain abnormal sounds and locating their position in the heart cycle, a feature of particular aid in training medical students. The photograph provides a permanent record of heart action.

*Science News Letter, March 2, 1935*

## PHYSICS

**Cosmic Rays Born of Structure of Universe**

THE latest theory put forward to explain the origin of the cosmic rays, in search of which physicists have sailed around the world, climbed the highest mountains, descended into the deepest mines, and risked their lives in stratosphere ascents, links these mysterious missiles with the structure of the whole universe.

Prof. E. A. Milne of Oxford, who a year ago surprised physicists by working out a theory of the universe in simple mathematical language in place of the complicated formulae in use since Einstein introduced his theory of relativity, explains how the cosmic rays, or rather particles draw upon the gravitational energy of the whole universe.

In Prof. Milne's universe-model any unimpeded free particle in the space between the stars and galaxies undergoes acceleration as reckoned by an observer located on one of the outer "universes" or nebulae. It goes faster and faster until it attains the speed of light, and then begins to slow down.

Now, says Prof. Milne, cosmic rays are nothing but such particles moving

with a speed nearly that of light, and drawing their energy from the infinite energy of the universe.

This explanation, he says, removes the "impasse" to which other theories of the origin of cosmic rays lead: that if the primary rays were born in the interior of stars, it is difficult to see how they could ever get out; and if they were born out of collisions in free space, there is not enough matter there to account for them.

Prof. Milne in contributing a preliminary statement (*Nature*, Feb. 2) announced the publication of a book in which he will expound more fully his theory of the origin and structure of the universe.

*Science News Letter, March 2, 1935*

## PHYSICS-METEOROLOGY

**Sun's Rays Are Hotter In Winter Than in Summer**

THE SUN'S rays which reach the earth in winter are actually hotter than those which strike the earth in summer, if measurements in both seasons are made at the same altitude of the sun, according to Dr. Bernhard Haurwitz, research associate at the Blue Hill Meteorological observatory at Harvard University.

Winter is colder than summer, Dr. Haurwitz has explained, not because the sun's rays are cooler, but because there are so many fewer hours of sunlight in that season and because the winter rays strike the earth at a generally lower angle.

The reasons the sun's rays are hotter in winter are several. The earth is nearer the sun in this season. There is much less water vapor in the air, an important factor since water vapor absorbs solar radiation. And, finally, winter air is less turbid or dusty than summer air, dust also tending to cut off more of the sun's heat from reaching earth.

In studies undertaken as part of an international meteorological research program, Dr. Haurwitz found that on the average December day there is enough heat in the sun's rays falling on a square foot of ground during the day to warm about three pints of water from its freezing to its boiling point.

In June, by contrast, the average day has enough heat per square foot of ground to raise 13 pints of water over the same range.

*Science News Letter, March 2, 1935*

**IN SCIENCE**

## MEDICINE

**Now It's Cevitamic Acid Instead of Orange Juice**

A BABY'S life gets safer every day. The latest aid to infancy is a tablet called cevitamic acid. The name is coined and means an acid containing vitamin C.

Its successful use in treating babies with scurvy is reported by Drs. Arthur F. Abt and I. M. Epstein of Northwestern University Medical School (*Journal of the American Medical Association*, Feb. 23). Most modern babies are given orange juice or tomato juice, both of which contain vitamin C, to protect them from scurvy. For babies who cannot retain either of these juices or who have been deprived of them by circumstance until scurvy has developed, these physicians have successfully used cevitamic acid in treating the disease.

The acid is commercially prepared from vegetable sources, such as cabbage, paprika, orange or lemon juice, and comes in tablet form.

*Science News Letter, March 2, 1935*

## DEMOGRAPHY

**Europe's Population Quadrupled in 200 Years**

MORE than four times as many people are in Europe now as there were two hundred years ago, is the conclusion of J. Halcizer. (*Geography*, abstracted in *Nature*, Jan. 5.)

Comparing 1930 census figures with incomplete census figures and estimates of past centuries, he calculates that in 1820 Europe's inhabitants were 1.89 times as many as in 1720. In 1930, Europe had 4.51 times its population of 1720.

The "center of gravity" of Europe's population has moved from a point about 45 miles east of Munich, where it was in 1720, to 30 miles north of Vienna, where the latest census would place it. This eastward shift amounts to 124 miles in two centuries.

*Science News Letter, March 2, 1935*



# THE FIELDS

## PHYSICS

## Chinese Paper Windows Transmit Ultraviolet

**P**LENTY of rickets-preventing ultraviolet rays pass through Chinese paper windows and these windows are far superior in this respect than ordinary window glass, it appears from measurements of various Chinese window materials made in the physics laboratory of Yenching University.

"Observers have repeatedly called attention to the fact that rickets is less prevalent among Chinese than among Western children," comments the *Diplomate*, official organ of the National Board of Medical Examiners.

Paper windows might therefore be used to replace the more expensive anti-rickets window-glass now on the market, it is suggested in the report of the Chinese experiments.

*Science News Letter, March 2, 1935*

## CHEMISTRY

## Milady's "Sweet Little Dress" Made of Sugar Cane

**S**UGAR cane may in some not-too-remote future yield not only sweetening for our breakfast coffee but rayon for milady's dress, cellulose to wrap the groceries she buys and lacquer to paint the car in which she goes shopping. Chemists of the U. S. Department of Agriculture are now at work in Washington and Hawaii, developing to the point of commercial practicability a process devised by D. F. J. Lynch of the Bureau of Chemistry and Soils, for making alpha cellulose out of sugar-cane bagasse.

Bagasse is the crushed fiber and pulp that is left after the cane has had its juice crushed out in the mill. Until recent years it has been sheer waste, burned as a supplementary fuel in the mills' boilers, or simply thrown away. At present there is a considerable use for it in making a certain type of building board; this process uses it practically "as is," crude fiber and all.

Alpha cellulose is a clean, white, cot-

tony substance used as the beginning point for chemical manufacturing processes leading to such diverse things as synthetic fibers, plastics, lacquers, etc. At present it is made chiefly from wood pulp and from cotton linters, the short fibers that still cling to the cotton seed after ginning.

Cellulose is present in practically all parts of all ordinary plants, but to get it out in the purified "alpha" form needed for industrial purposes, various other substances must be separated by chemical processes, which are different for each kind of plant material. A few species of wood have been the first for which these processes could be worked out on a paying basis; but now cane bagasse promises to take its place along with wood, and such things as corn-cobs and cornstalks, peanut hulls and cotton stalks are attracting chemists' attention.

Dr. W. W. Skinner of the Bureau of Chemistry and Soils recently stated that in Hawaii, Puerto Rico, the Philippines and Louisiana there is sufficient bagasse produced annually to work up into 750,000 tons of alpha cellulose.

"The possibilities in the development of synthetic fibers is only now being fully visualized," said Dr. Skinner. "With the advent of this new supply of alpha cellulose at a small production cost and of the highest quality, the possibilities of its use either alone or in combination with such natural fibers as cotton, flax, silk and wool are considered almost unlimited. It may have as great an effect in the progress and development of world agriculture as had Faraday's invention of the electric motor upon the industrial power requirements of the world."

*Science News Letter, March 2, 1935*

## ASTRONOMY

## Telescope Site Has 300 Clear Nights a Year

See Front Cover

**T**HE giant dome for the McDonald Observatory pictured on the front cover of this week's SCIENCE NEWS LETTER is now completed and ready for the installation of its huge 80-inch telescope as soon as the instrument has been ground.

Mount Locke, in Texas, was selected as the site for the new telescope because a survey showed that that location is blessed with more than 300 clear nights a year on which astronomers will be able to watch the stars.

*Science News Letter, March 2, 1935*

## DEMOGRAPHY

## New York's Great White Way Is Residence Section

**G**REENWICH Village, considered the Bohemia of New York by New Yorkers themselves as well as by visitors, is not a Latin quarter on the basis of nationality of the heads of families. Native-born family heads outnumber foreign-born more than two to one in a large part of the district, according to the Welfare Council of New York. On the other hand, in the section of the city where fashionable Sutton Place is located, foreign-born family heads outnumber the native-born by a ratio of three to two. These are conclusions from new United States Census Bureau figures which explode a good many fallacies in general circulation regarding certain areas of New York City.

The business and theater district, which includes the New York Times and Herald-Tribune buildings, the theaters and movie houses, restaurants, cafeterias, and night clubs, the Empire State Building, and the Public Library, is very definitely a residence section and has a large resident population, for whom this famous playground is "home"—not of transients but of regular resident family groups. Although it is the "hangout" of the playboy—and playgirl—a large proportion of people living there are over 35 years of age.

The tip of Manhattan, extending south from Canal Street to the Battery, and including Wall Street, the Stock Exchange, Trinity Church, St. Paul's and the Aquarium, was formerly the Turkish quarter, where fibers of spiced odors were detected in the wind's fabric, meat was seen cooking on spits, and there was thick, sweet coffee in little copper pots. There is remaining a mere vestige of its earlier national strain—only six Turks, all males, now being residents of the district.

The Census figures show that the largest number of foreign-born family heads in New York City are Italian, the next Russian, followed by Polish, with German fourth and the Irish Free State fifth, while the smallest is French—only 8,021 French-born family heads in all the polygenic city, outnumbered by the Greeks, with 10,594.

A demographic phenomenon is shown in the Negro population, which more than doubled between 1920 and 1930, being 272,952 in the latter year, as compared with 122,031 in 1920 and 79,952 in 1910.

*Science News Letter, March 2, 1935*

## PHYSIOLOGY

## Establishes Amount of Vitamin B Needed in Diet

**W**HAT is believed to be the first exhaustive study of any of the vitamins from the point of view of how much a human being needs has been made at Yale University by Dr. George R. Cowgill, associate professor of physiological chemistry.

Dr. Cowgill has devoted his research to the vitamin B requirements of man and has established a measure by which nutritionists can determine whether an individual's diet contains enough of this important food factor. The results of Dr. Cowgill's study have been published by the Yale University Press for the Institute of Human Relations.

Deficiency of vitamin B in the diet has long been known to be the cause of beriberi, a disease which constitutes one of the most serious medical problems in the Far East.

The greatest significance attaching to vitamin B for people living in North America is the fact that it may be a cause of various chronic conditions summarized under the vague term "ill-health," according to Dr. Cowgill. In these instances the shortage of the vitamin may not be great enough to result in manifest beriberi but sufficient to produce a complication difficult to recognize and one which therefore escapes treatment, he observes. Various gastrointestinal disorders, such as gastric ulcers and colitis, can be related to vitamin B deficiency; certain heart disorders; and various neurological conditions may have their beginnings in a diet lacking sufficient amounts of this vitamin.

Body weight and vigor of vital processes (metabolism) were found by Dr. Cowgill to be the most important variables determining vitamin B requirement.

In approaching the problem, Dr. Cowgill made studies of diets associated with beriberi and diets not associated with the disease. Among the former were those of families in Labrador, Newfoundland, and Calcutta; prison diets in the Far East, notably in Manila, Selangor, and Singapore; and diets of various seamen and soldiers. A study of limited diets not associated with beriberi included a variety such as those of

American white and Negro families, rations allowed by the German Government for civilians during the winter of 1916-1917, and the dietaries of workers on sugar and cacao plantations in the East and West Indies.

He has established that the ratio of the amount of the vitamin to the energy yielding value of the diet correlated with the body weight and metabolism expresses the adequacy of the diet in vitamin content. Thus the diets associated with beriberi showed an average ratio of 1.74, while in diets where the disease did not occur, the ratio was 2.18.

Men require more vitamin B than women, it appears from Dr. Cowgill's report.

"Students of the beriberi problem have frequently commented on the fact that this disorder is preeminently a disease of young adult males," he says. "As

an explanation of this it has been suggested that beriberi is chiefly an 'institutional disease,' that is to say, a disorder found in jails, asylums, groups of laborers and the like, and that the conditions in society which operate to form these groups affect men more than women. The results of the present study suggest another explanation. The formula derived from the quantitative studies indicates that the two most important variables determining the vitamin B requirement are the body weight and the metabolism.

"Now it is generally known that males have a distinctly higher rate of metabolism than females, and being usually heavier and more active, consequently consume greater quantities of food. Therefore, males have a higher total energy exchange per day. Under conditions where the vitamin B content of the ration proves to be very close to that required by the organism, there is little or no factor of safety against beriberi, and this sex difference in total metabolism may be the chief factor determining whether beriberi shall develop. Under such circumstances it is obvious that the males should be more liable to the disease."

*Science News Letter, March 2, 1935*

## ENGINEERING

## Synthetic Gasoline Promises Sixth More Power for Planes

**B**Y using a new "rebuilt" gasoline with ideal 100 octane antiknock rating, the Army has found a way to increase the power output of airplane engines by nearly a sixth to a third without increasing the weight of gasoline used.

Lieut. Frank D. Klein of Wright Field revealed to the Institute of the Aeronautical Sciences meeting at New York that experiments during the past few months with 2000 gallons of a special lead blended iso-octane gasoline have demonstrated the superiority of the new fuel over the 92 octane gasoline that is the present Army Air Corps standard.

This means that with engines designed to take full advantage of the new fuel, the fighting and bombing planes of the Army Air Corps will be able to fly farther and faster without carrying more gasoline weight.

In 1928, a 33 per cent. increase in power output was obtained by redesign of engines to use the now standard 92 octane gasoline instead of a 50 octane gasoline. Thus army airplanes will in the future be delivering about 70 per cent. more power per pound of gasoline than the airplanes used earlier than seven years ago.

Synthetic gasoline must be made to satisfy the very high octane rating demanded, Dr. Graham Edgar of the Ethyl Gasoline Corporation explained. Petroleum will still be used as raw material but the molecules will be broken down into small bits and then rebuilt into new fuels.

Several oil refineries have made in the last two years substantial quantities of iso-octane which is the chemical compound used as the ideal standard in testing the antiknock qualities of tetraethyl





#### 550 B.C. ADVERTISING GAVE ATHENS POTTERY BOOM

Five of the fifty Greek vases in the Albert Gallatin Collection loaned for exhibition to the University Museum. They represent the fifth and sixth centuries B.C., when Athenians advertised their pottery art and "got results."

lead and other gasoline additions. The new experimental army aviation gasoline was composed half of iso-octane and half of good quality ordinary aviation with ethyl addition.

The new superior gasolines will cost more per gallon than present aviation

fuels but since they will contain more power per pound, they promise to be actually more economical. Dr. Edgar urged the consideration of fuel cost per ton-mile of payload carried rather than the cost per gallon.

*Science News Letter, March 2, 1935*

#### PHYSICS

## Universe Infinite In Particles; Finite In Space

THE universe contains an infinite number of particles but its volume is finite. This is the paradoxical answer given by Prof. E. A. Milne of Oxford to a Science Service representative upon the occasion of his receiving the Royal Astronomical Society gold medal.

"Is the universe infinite?" Prof. Milne was asked.

"It is necessary to distinguish between whether the number of particles in the universe is infinite and whether the amount of space used by one observer is infinite," he answered. "I believe the right answer is that most probably the universe has an infinite number of particles in a finite space."

Imagine an ideal telescope which is infinitely powerful, Prof. Milne suggested. Then one would see that the more distant the nebulae the nearer they would be together. They would be closer and closer, fainter and fainter and ultimately they would shade into a continuous background.

"What would this be like?"

"Picture yourself inside a cloud which was infinitely dense at its circumference," said Prof. Milne.

Prof. Milne is recognized for his mathematical explanation of the expanding universe in terms of ordinary three-dimensional or Euclidean space.

"I don't believe curved space is anything more than a possible method of expression," Prof. Milne said. "I think that my calculations using Euclidean space provide a greatly simplified picture of the universe."

He did not oppose Einstein's work, however, and he explained that Einstein's early work is fundamental to his theory.

*Science News Letter, March 2, 1935*

It was supposed that garden peas lose sweetness after picking because the sugar turned to starch, but tests indicate that the sugar is apparently used in respiration.

#### ARCHAEOLOGY

## Advertising Stunts Were Practised By Greeks, Too

THE ancient Greeks, too, had clever advertising stunts. In the sixth century B.C. olive oil was given as prizes to foreign athletes competing in the Panathenaic games—and the Athenians packaged the oil prizes in beautiful vases.

As a result there came from Egypt, Africa, Russia, Spain and Gaul, a flood of orders for Athenian vases and Athens obtained a virtual monopoly of the world's pottery trade.

This close attention to making the package attractive, which sold more of the package-vases, is the reverse of what modern advertisers do when they improve the package to sell more of the contents.

Jotham Johnson, archaeologist of the University Museum in Philadelphia, Pa., told of the advertising techniques of the ancient Greeks during a loan exhibition of one of the world's best private collections of the Athenian vases.

In addition to vases, Athenian potters made jars, flasks, pitchers, drinking cups and other utensils, ornamental and practical. So complete was the Athenian monopoly that the best artists from other countries were imported to design the products. Connoisseurs today judge that Athenian vases reached their highest beauty in the fifth century B.C.

*Science News Letter, March 2, 1935*

#### ENTOMOLOGY

## Bright-Colored Butterflies Avoided by Birds

BIRDS really do avoid butterflies whose bright "warning" coloration advertises their inedibility, Prof. G. D. Hale Carpenter of Oxford University declares (*Nature, Feb. 2*).

Prof. Carpenter received the information on which he bases his communication from a naturalist in Africa, T. H. E. Jackson, of Kitale, Kenya Colony. On an expedition into Uganda, Mr. Jackson noticed birds feeding on butterflies that crowded among the flowers of a blossoming tree. Under the tree he found many wings of the insects, broken off by the birds before they swallowed their prey, some of them with the marks of beaks imprinted plainly on them. By comparing the numbers of these witnesses of insect tragedy with the relative abundance of the various species he

could see in the tree, Mr. Jackson made an estimate of the feeding preferences of the birds. This estimate, he says, supports the idea that birds really do avoid "warningly" colored butterflies.

In this conclusion, Prof. Carpenter and Mr. Jackson are at variance with the opinion of an American zoologist, W.

L. McAtee of the bureau of biological survey, U. S. Department of Agriculture, who some time ago stated that insects and other animals get killed and eaten approximately in proportion to their numbers in a given place, regardless of coloration.

*Science News Letter, March 2, 1935*

#### CHEMISTRY

## 20 New Kinds of Matter Reported By British Chemist

**D**ISCOVERY of some 20 new varieties of the chemical elements, called isotopes, was announced to the Royal Society, London, by the world authority and Nobelist, Prof. F. W. Aston of Cambridge, as the result of several years of exacting spectrographic work on a dozen elemental substances.

The census of isotopes kept by Prof. Aston shows that 247 stable element varieties are now known from 79 of the 92 elements.

Isotopes in chemistry correspond roughly to non-identical twins in animals, since they are the same stuff but the atom of one isotope has a different mass or weight than another isotope of the same element.

The new isotopes are of the elements hafnium, thorium, rhodium, titanium, zirconium, calcium, gallium, silver, carbon, nickel, cadmium, iron and indium. They were discovered by mass spectrograph analyses made either by the anode ray or more usual discharge method. The mass spectrograph is an instrument that serves as an extremely sensitive balance for weighing the elements.

Important also was Prof. Aston's announcement that he had discovered rays from hafnium, thorium and rhodium for the first time.

Because an average of three and a tenth isotopes for every chemical element has been discovered, this is taken to mean that there is a stable elementary atom for every whole number weight from one to 210.

"This is an astonishing situation," Prof. Aston said, "and I believe the discovery of many more such isotopes is unlikely at least for many years unless by quite new methods."

Prof. Aston cited with approval the theory of Prof. Gamow, Soviet physicist now lecturing at George Washington University, Washington, D. C., that if more isotopes are discovered they will probably be radioactive, breaking down into other isotopes.

Not content with his pioneering explorations of atom varieties, Prof. Aston said that he would modify his apparatus in the hope of obtaining still finer and more accurate measurements of atomic masses.

*Science News Letter, March 2, 1935*

#### SOCIOLOGY

## Most Murderers Are Laborers, Survey Shows

**D**O you picture the average murderer as being a "master mind" with superior crafty intelligence and good education, and the victim as a "wealthy clubman" or a person of wealth and prominence like Lindbergh?

Study of the homicides actually committed over a decade in 37 counties in New York state shows that this favorite picture of fiction is not based on fact. If the New York situation is typical of the nation as a whole, neither victims nor persons convicted of murder belong, in general, to the respectable, well-to-do classes. It was found that 57 per cent. of the victims and 77 per cent. of

the convicts were laborers, skilled or unskilled.

A far larger proportion than you might expect were foreign born. Of the 1,166 victims, 481 were foreign born, and 55 per cent. of these were Italians. Of the 632 native born victims, 112 were Negroes. The convicts showed a similar picture of foreign and Negro frequency. Of the 388 convicted, 142 were foreign, and 91 were from Italy.

The typical murderer is not a college graduate putting his learning to evil uses by concocting weird poisons for his victims. He is a comparatively uneducated person. Of the 388 persons convicted of murder included in this survey, only 38 had ever attended high school and of these only six had ever gone to college. Not a single one of the women had gone beyond elementary school. And 62 had had no formal education at all.

#### Poisoning Infrequent

Actually, poisons are very seldom used. By far the most common way murdered persons meet death is by firearms, 64 per cent. of the men and 59 per cent. of the women having been shot down. Next in frequency comes the knife or other cutting or piercing instrument, which is particularly common among the Negroes.

Fracture of the skull or a blow on the head, such as killed the little Lindbergh baby, accounted for 78 of the male deaths and eleven of the female. But burns, acid, and poison together took toll of only eight men and nine women.

The solution of the murder problem in the United States does not lie in excluding persons of any special hereditary background, is the conclusion of the investigators, J. V. DePorte and Elizabeth Parkhurst, who made the survey (*Human Biology*, Feb.)

The germ plasm has nothing to do with the case, they conclude. Although the homicide rate was exceptionally high among Italian immigrants, the rate among the native-born of Italian parentage was only 8 per cent. of the rate among Italian immigrants, and the rate among the immigrants much higher than that prevailing in Italy.

The only guarantee of the worth of an individual for the breeding of a superior race is not its own superiority, but the superiority of its progeny, and this is just as true of the human "bean" as of the vegetable bean about which the statement was originally made, the investigators conclude.

*Science News Letter, March 2, 1935*

## ● RADIO

Tuesday, March 5, 4:30 p. m.

THE MAGIC AGE OF ALLOYS, by A. B. Parsons, Secretary, American Institute of Mining & Metallurgical Engineers.

Tuesday, March 12, 4:30 p. m.

GLAND FACTORS IN PERSONALITY, by Dr. R. G. Hoskins, Memorial Foundation for Neuro-Endocrine Research, Harvard University.

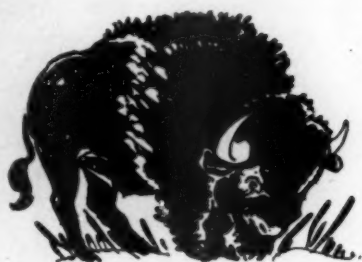
In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.



ECOLOGY

## NATURE RAMBLINGS

by Frank Thone



Bluegrass or Bluestem?

**G**RASSLANDS of the western prairie region are in a state of dramatic suspense. Blighted by last year's unprecedented drought, large areas in them are now seemingly bare of life. They are, botanically speaking, public domain, unclaimed homesteads, which the first to come among plants, and the most tenacious to hold, may claim and keep as their own. Which will take them, lush bluegrass from the East, or harder bluestem of the West?

When the five-year drought began in 1929, these pasture lands had long belonged to the immigrant bluegrass, encouraged by grazing and able to compete with the native prairie grasses as long as there was abundant rain. But when the drought reached its sky-seared, soil-bankrupt climax last summer, the bluegrass was the first to die. Now its place is empty. Will its children succeed it, or will offspring of the western grasses reclaim the heritage that was theirs in an earlier generation?

Studies conducted by Prof. J. E. Weaver of the University of Nebraska, and by his graduate aides Lawrence Stoddard and William Noll, suggest that the victor's spoils may go to the sons of the native-born; indeed, if water shortage continues, will almost surely do so.

Nearly a year ago, foreseeing what the summer might bring, the three ecologists began a program of careful observations of prairie vegetation under drought, which they continued throughout the blazing summer. In general, they found that fitness for survival in a drought-cursed land was determined by two things: ability to get water and, water once got, ability to keep it.

Bluegrass, not native to such an unkind clime, could neither keep what it

had, nor renew its supplies for long, since its roots are shallow. The native bluestem grass species, with roots that drill into the soil two or three times as deeply as do those of bluegrass, could tap reserve supplies, depleted as even these became, and so come through a lean year with life still in their clutch.

What was true of the deep-rooted grasses Dr. Weaver and his associates found even truer of other deep-rooted prairie plants. The prairie shoestring, big, lusty, blue-flowered legume, has roots sometimes sixteen feet long. It easily withstood the drought and bore a big crop of seeds, as though nothing unusual were happening. So also with

others of its biological brethren; though it is true that many of them were forced into abnormally early blossoming.

Two devices for hanging onto water once obtained demonstrated themselves strikingly. One is the reduction of leaf-area by rolling the leaves or other evaporation-defeating tricks; the other the retention of water by the "thickening" of the sap, until its resistance to further loss, in at least one plant tested, rose to the equivalent of sixty atmospheres, or a pressure of nearly half a ton to the square inch.

When stress-times come to the prairie, truly the toughest survive!

*Science News Letter, March 2, 1935*

PHYSIOLOGY

## Female Sex Hormone Starts "Wild" Growth of Cells

**B**Y MAKING cells grow "wild," the female sex hormone may play an important part in causing cancer. First definite proof of a long-suspected but unproved relation between sex and cancer has been found by a group of Canadian investigators, Prof. J. B. Collip and Drs. H. Selye and D. L. Thomson of McGill University.

"Our findings are at the moment without practical significance," says Prof. Collip.

But though scientists are not yet able to foresee how this discovery can be applied to human cases of cancer, they nevertheless view this progress as a valuable addition to knowledge.

Daily injections of the sex hormone for ten weeks produced in rats symptoms closely resembling the beginning stages of cancer growth, Prof. Collip and associates have reported (*Nature*, Jan. 12.)

Certain cells in the animals' bodies showed changes in their nature and growth that made them look, to the scientist's eye, like the wildly-growing cells of cancer. In the words of the scientific report, the animals' uteri showed "more or less complete metaplasia" or change of the "cylindrical secretory epithelium into a stratified squamous epithelium with cornification from which irregular buds penetrated deep into the stroma" or underlying tissue.

The female sex hormone has been suspected of possibly causing cancer or

at least being able to cause it ever since chemists discovered that this hormone and certain coal tars known to produce cancer are strikingly similar in chemical composition. Medical scientists have been trying to settle the point and one group of investigators found evidence strongly suggesting that the female sex hormone could produce cancerous changes. The results of Prof. Collip and associates are more definite, however.

Their discovery came in the course of investigating anti-hormone effects. The McGill group of scientists has found

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that after repeated doses of hormone from the anterior pituitary gland, the body builds up a resistance to the hormone, an anti-hormone effect. They were trying to find whether this anti-hormone effect would also be produced by repeated injections of the female sex

hormone when they discovered that excess amounts of the hormone did produce tissue changes similar to the beginning stages of cancer. In their experiments they used a hormone prepared by Dr. A. Girard of Paris.

*Science News Letter, March 2, 1935*

#### POPULATION

## Number Aged Over 65 May Double in Next 35 Years

**One Out of Every Ten Persons Will Be in This Group By 1970, is Estimate; Half Will be Dependent**

**T**HE NUMBER of persons over 65 years of age which will be affected by the legislation for old-age pensions now before Congress is expected to increase greatly in the next few years, doubling in number in 35 years.

America is rapidly growing older. Thirty-five years ago, at the beginning of the century, about 4,000,000 people in the United States were 65 or older. Today 7,500,000 persons are in that age group. By 1970, the aged will be increased to more than 15,000,000. This outlook for a rapidly aging population is revealed in figures presented to President Roosevelt by the Committee on Economic Security.

Thus, the report indicates, the problem of old-age security is one not of immediate relief alone, but of provision for a growing need in the future.

Not only are the numbers of old people increasing, as one might expect in a growing population, but the proportion of old people is also becoming magnified. In 1900, America had just a fraction over 4 per cent. in the age group over 65. By 1930, this proportion had increased to 5.4. But by 1970 the Committee expects the percentage to

have reached 10. Of every hundred men, women, and children in the United States 35 years from now, ten will be 65 years old or older.

If you are now a young man of 30, what are your prospects for the future? If you live for the next 35 years, you will then be one of the 15,000,000 people in the United States in the "old age" group. The chances at present are about 50-50 that you will be dependent, either on relatives, friends, or public charity.

Not so many people over 65 are finding employment as they did in the past. If you have been a long time with one firm, a survey has revealed, you are less likely to be dismissed than a younger worker. If you have drifted about a good bit from job to job, you will not have that advantage. In case you do lose your job, you are far less apt to secure new employment than younger workers are.

The Committee estimates that although 31.6 per cent. of the men over 65 were unemployed in 1900, that high figure has increased to 41.7 per cent in 1930. And the tendency is still upward.

Will you have saved enough to take care of yourself during your old age? That depends upon your present income. Five and three-quarter million families in the United States had in 1929 an income of \$1,000 or less. They were not able to put aside anything for approaching rainy days. Ten and a half million families, the most representative American group, made between \$1,000 and \$2,000 dollars. These families saved a total of \$750,000,000. A little manipulation of a calculating machine will show you that that seemingly large sum, when divided ten and a half million ways, gives a sum for each family of but \$71. How long could you live on less than a hundred dollars?

The man who lives to be 65 years old may reasonably expect to live 11 or 12 years longer. Women, at the same age, may expect to live 15 years. If you should be among the 15,000,000 who are 65 in 1970, and you wish to have an income of \$25 a month for the rest of your life, you should have saved, the Committee estimates, about \$3,300 or \$3,600, not \$71.

Only families having incomes larger than \$10,000 a year save as much as this amount on the average.

"If only this amount of income is allowed to all of the people of 65 years and over, the cost of support of the aged would represent a claim upon current national production of \$2,000,000,000 per year," the Committee reports. "Regardless of what may be done to improve their condition this cost of supporting the aged will continue to increase. In another generation it will be at least double the present total."

*Science News Letter, March 2, 1935*

#### PSYCHOLOGY

### Children's Nicknames Merely Lead to Fights

**C**HILDREN'S nicknames, in 95 cases out of 100, have no value and merely lead to resentment, ill feeling, fighting and quarreling, Drs. Samuel Z. Orgel and Jacob Tuckman of New York City reported to the American Orthopsychiatric Association.

These scientists studied the nicknames of 235 boys and 75 girls, of average normal intelligence and ranging in age from 8 to 16 years, who live at a child-caring institution of the cottage-plan type sponsored by the Hebrew Sheltering Guardian Society of New York.

Only 3.5 per cent. of the boys and 4 per cent. of the girls had no nicknames. Girls use nicknames of the affec-

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tionate form and avoid those which are derogatory or which deal with the obscene or with personality defects, the investigators found.

More than a third of the boys had nicknames referring to personality defects, nearly a third had nicknames referring to physical defects, and the rest either had no nicknames or had one falling into one of the following cate-

gories; endearment or affectionate contraction; sweetheart's name; nationality or place of birth; name of animal; distortion of name, and miscellaneous.

Of the girls, nearly a third belonged in the "affectionate" classification, about the same number in the "physical defects" category and 15 out of a hundred in the "distortion of name" category.

*Science News Letter, March 2, 1935*

PSYCHIATRY

## Hereditry Shares Blame For Ecstasy-Despair Insanity

### Richer Emotions of Women Also Linked To Inheritance by Study of 180 Twins

**T**HE KIND of insanity that swings a person from exalted ecstasy to despondency and despair is the "most hereditary" of all the common types of mental ailments.

Examination of 90 pairs of twins by scientists at the Los Angeles Diagnostic Clinic in Los Angeles, revealed this information about what is known to physicians as manic-depressive insanity.

The richer emotional life of women may be due to the same inheritance, which, combined with other hereditary factors and life experiences, leads to the manic-depressive state, the scientists theorized.

The hereditary make-up of the individual must share the blame for his mental breakdown, it was found. What happens to him during life is also important. Two heredity elements, called "cyclothymic" and "activating" by the scientists, are concerned. Both of these are widely distributed among human beings. Any person may have his share of either one of them. But neither one, acting alone, can produce the disease, nor can the results of experience when the hereditary factors are not present.

It is only when both hereditary factors are present that an experience such as a severe illness or a mental strain may bring it on.

One or both members of each of the 90 pairs of twins studied suffered from manic-depressive insanity. Study of the frequency with which the other members were also affected led to the new theory of the cause of this mental illness presented by Dr. Aaron J. Rosanoff, Leva M. Handy, and Isabel Rosanoff Plesset.

ance, temperament, and hereditary background. Of these, both twins were affected in only 11 instances, while in 56 instances only one twin of each pair was manic-depressive. In one case, one of the twins was manic-depressive while the other was an imbecile.

Women are more susceptible to manic-depressive insanity than are men. This fact may be one reason why so many of the unlike twins had only one of each pair affected; many unlike twins are brother-sister combinations.

First among the causes of manic-depressive insanity is what the scientists call a "cyclothymic" factor, which is widely distributed by heredity among humans and has to do with the emotions of mankind. It does not cause mental disease unless it is combined with another hereditary factor called the "activating" factor.

The activating factor is present in the X-chromosomes which determine sex, and is therefore more likely to appear in women than in men, because women have two of these chromosomes. It may be this factor, the investigators say, that accounts for the somewhat richer emotional life of women.

Like the cyclothymic factor, the activating factor alone is not capable of producing mental disease.

Finally, some unfortunate experience is needed to "set off" the hereditary factors and produce the disease. This "last straw" that breaks down the patient may be physical, such as an illness, a birth injury, or even a blow on the head. But in the majority of cases, it is a psychological experience such as loss of employment, financial loss, disappointment in love, or a death in the family.

The unfortunate combination of two hereditary factors plus one or more environmental conditions, produces the manic-depressive insanity, the investigator showed.

*Science News Letter, March 2, 1935*

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*Science News Letter*, March 2, 1935

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*Science News Letter*, March 2, 1935

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## Medicine

**DISEASES OF THE HEART, A SUMMARY FOR LAYMAN AND LECTURER**—Haven Emerson and others—*American Heart Assn.*, 35 p., 25c. This little booklet gives much specific information about heart diseases, their prevalence, causes and kinds, symptoms and treatment. The book will answer many questions for the layman although the chapters covering signs, laboratory diagnosis and symptoms seem rather technical for lay reading.

*Science News Letter*, March 2, 1935

## Aeronautics

**REPORT OF THE FEDERAL AVIATION COMMISSION, JANUARY, 1935**—*Govt. Print. Off.*, 254 p., 20c.

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## Mathematics

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## Medicine

**RATS, LICE AND HISTORY**—Hans Zinsser—*Little, Brown*, 301 p., \$2.75. For the intelligent reader, this book is a highly entertaining discussion of typhus fever and of many other things, ranging from Freudianism to modern literature. In fact, it is much more than an entertaining, easy-to-read life history of typhus fever—one hesitates to say popular in view of Dr. Zinsser's opinion of "popular science." It is a commentary on civilization. But it may prove disappointing to the reader who is looking for a popular account of typhus fever, its spread and importance. Such a reader will have to skip the first ten or twelve chapters to get to the explanation of typhus fever. If he does skip them he will miss much that is important and even if he reads these first chapters, unless he has more knowledge of the subjects discussed than most readers of popular science books, he will still miss much. For many of Dr. Zinsser's comments require special knowledge for their full appreciation.

*Science News Letter*, March 2, 1935

## Sociology

**THE CRIPPLED AND THE DISABLED**—Henry H. Kessler—*Columbia University Press*, 337 p., \$4. The medical director of the New Jersey Rehabilitation Commission discusses the problem of the crippled and the disabled as one of vocational maladjustment and makes definite recommendations for its solution. He believes that the present-day efforts at social and economic adjustment should include efforts to solve this problem of the disabled.

*Science News Letter*, March 2, 1935

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